



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,507	02/25/2004	Eric Bouillon	BDL-451XX	4009
207	7590	11/25/2005	EXAMINER	
WEINGARTEN, SCHURGIN, GAGNEBIN & LEOVICI LLP TEN POST OFFICE SQUARE BOSTON, MA 02109			AGRAWAL, CHRISTOPHER K	
			ART UNIT	PAPER NUMBER
			3726	

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/786,507	Applicant(s) BOUILLON ET AL.	
	Examiner Christopher K. Agrawal	Art Unit 3726	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 6-15 is/are rejected.
- 7) ☒ Claim(s) 3-5 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/25/04; 10/21/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
2. Line 35 of page 1 contains the following: "layers of felt," Line 12 of page 8 contains the following: "layers of felt; ...;." Please replace with acceptably descriptive language.
3. The application contains repeated reference to "the or each fiber structure". Please amend all sections of the application to read --each fiber structure--.
4. Line 5 of page 13 contains reads "fiber structures 30 and 40." Please amend to read --fiber structures 30 and 36--.
5. Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1, 2, 12, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Boyce et. al. (U.S. Patent No. 4,808,461).**
8. Claim 1: Boyce et. al. teach a method of making a fiber blank **30** from at least one porous fiber structure, the method comprising the steps of: consolidating the porous

fiber structure by forming within it a deposit of a refractory material (**Col. 2 lines 30-36**) by partially densifying the fiber structure so as to bond together the fibers of the fiber structure to enable the fiber structure to be handled without being deformed (**Col. 2 lines 46-51**), and implanting rigid pins through the consolidating porous structure (**Col. 2 lines 15-25; Fig. 5**).

9. With respect to leaving empty the major fraction of the initial pore volume of the fiber structure, this limitation is interpreted to be anticipated by the recital of Boyce of selectively pressing during consolidation (**Col. 2 lines 46-51**).

10. Claim 2: Boyce et. al. teach a method of making a fiber blank by bonding together porous fiber structures in order to obtain a blank of desired shape (**Fig. 2; see 32**), the method comprising the following steps: consolidating each porous fiber structure by forming within it a deposit of a refractory material by partially densifying the fiber structure so as to bond together the fibers of the fiber structure to enable the fiber structure to be handled without being deformed (**Col. 2 lines 30-36 and 46-51**); putting the consolidated fiber structures together; and connecting them together by implanting pins of rigid material through the adjoining consolidated fiber structures (**Col. 2 lines 15-25; Fig. 5**).

11. With respect to leaving empty the major fraction of the initial pore volume of the fiber structure, this limitation is interpreted to be anticipated by the recital of Boyce of selectively pressing during consolidation (**Col. 2 lines 46-51**).

12. Claim 12: Boyce et. al. also teach the method of claim 1 wherein pins are used that are made in the form of rigid monofilaments (**Col. 2 lines 2-5**).

13. Claim 13: Boyce et. al. also teach the method of claim 1 wherein the pins are used in the form of sticks of thermostructural composite material (**Col. 2 lines 5-30**).

14. Claim 15: Boyce et. al. also teach the method of making a fiber-reinforced composite material part, wherein a blank is made of shape corresponding to the shape of the part that is to be made by means of a method according to claim 1 (**Figs. 2 and 8; Col. 3 lines 30-33**), after which the blank is densified by depositing a matrix within the remaining pore volume of each consolidated fiber structure (**Col. 2 lines 31-36; Col. 3 lines 36-65**).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. **Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyce et. al. (U.S. Patent No. 4,808,461) in view of applicant's admitted prior art.**

17. Claim 6: Boyce et. al. teach the method of claim 1 but do not specifically teach the method wherein each fiber structure is consolidated by forming a deposit of ceramic or of carbon.

18. Applicant's admitted prior art (**page 2, lines 15-20**) teaches the method wherein each fiber structure is consolidated by forming a deposit of ceramic or of carbon.

19. It would have been obvious to one of ordinary skill in the art at the time of the invention to have incorporated the ceramic or carbon deposit of applicant's admitted prior art with the method of Boyce et. al. for the purpose of providing desirable consolidation properties.

20. Claim 7: Boyce et. al./Applicant's admitted prior art teach the method of claim 6 as described above. Applicant's admitted prior art (**page 2, line 10**) also teaches the method wherein each fiber structure is consolidated by chemical vapor infiltration.

21. It would have been obvious to one of ordinary skill in the art at the time of the invention to have incorporated the chemical vapor infiltration of applicant's admitted prior art with the method of Boyce et. al. for the purpose of providing desirable consolidation properties.

22. Claim 8: Boyce et. al./Applicant's admitted prior art teach the method of claim 7 as described above. Applicant's admitted prior art (**page 1, lines 27-32**) also teaches the method wherein each fiber structure is consolidated by forming a ceramic deposit by chemical vapor infiltration after forming an interphase layer on the fibers of the fiber structure, said interphase layer lying between the fibers and the ceramic deposit.

23. It would have been obvious to one of ordinary skill in the art at the time of the invention to have incorporated the interphase layer of applicant's admitted prior art with the method of Boyce et. al. for the purpose of providing desirable reinforcement of the fibers.

24. Claim 9: Boyce et. al./Applicant's admitted prior art teach the method of claim 6 as described above. Applicant's admitted prior art (**page 2, lines 3-8**) also teaches the

Art Unit: 3726

method wherein each fiber structure is consolidated by being impregnated with a liquid composition containing a ceramic or carbon precursor, and by transforming the precursor into ceramic or carbon.

25. It would have been obvious to one of ordinary skill in the art at the time of the invention to have incorporated the precursor method of applicant's admitted prior art with the method of Boyce et. al. for the purpose of providing ideal densification properties.

26. Claim 10: Boyce et. al./Applicant's admitted prior art teach the method of claim 9 as described above but do not specifically teach the method wherein a composition is used containing a ceramic or carbon precursor in solution.

27. Examiner notes that it is well known in the art of composite making to provide a ceramic or carbon precursor in solution. Therefore, it would have been well within the ordinary skill in the art to have incorporated a ceramic or carbon precursor in solution in the precursor methods of Boyce/Applicant's admitted prior art.

28. Claim 11: Boyce et. al. teach the method of claim 1 but do not specifically teach the method wherein pins are used that have been made by densifying and stiffening a yarn or tow by means of a matrix.

29. Applicant's admitted prior art (**page 1, lines 20-26**) teaches the method wherein pins are used that have been made by densifying and stiffening a yarn or tow by means of a matrix.

30. It would have been obvious to one of ordinary skill in the art at the time of the invention to have incorporated the matrix of applicant's admitted prior art with the method of Boyce et. al. for the purpose of densifying and stiffening.

31. **Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boyce et. al. (U.S. Patent No. 4,808,461) in view of Childress (U.S. Patent No. 6,268,049).**

32. Claim 14: Boyce et. al. teach the method of claim 1 as described above but do not specifically teach the method wherein the pins are implanted in at least two different directions.

33. Childress teaches the method wherein the pins are implanted in at least two different directions (**Fig. 2; Col. 4 lines 46-55**) for the purpose of providing ideal reinforcing properties and to prevent cracking.

34. It would have been obvious to one of ordinary skill in the art at the time of the invention to have incorporated the multidirectional pins of Childress in the method of Boyce et. al. for the purpose of providing ideal reinforcing properties and to prevent cracking.

Allowable Subject Matter

35. Claims 3-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

36. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,740,381 teaches fiber reinforced composite cores and panels.

U.S. Patent No. 6,821,368 teaches a co-bonded joint with z-pins.

U.S. Patent No. 6,436,507 teaches composites joined with z-pin reinforcement.


U.S. Patent No. 6,648,147 teaches a phase-separation member.

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher K. Agrawal whose telephone number is (571) 272-3578. The examiner can normally be reached on Mon-Fri 8AM-4:30PM.

38. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Jimenez can be reached on (571)272-4530. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

39. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CKA


MARC JIMENEZ
PRIMARY EXAMINER
11/22/05